Early Learning Coalition of Duval Report 2015-16:

School Readiness

Early Learning Coalition of Duval
Your One-Stop Early Learning Resource

EARLY LEARNING COALITION OF DUVAL REPORT

2015-16: SCHOOL READINESS

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The Early Learning Coalition of Duval, Inc. (ELC) has responsibility for improving the quality of early care and learning services provided to Duval County's youngest citizens, with a special focus on programs serving the most vulnerable children.

Evaluation Design

Measurement—BBCS-3:R

The Bracken Basic Concept Scale—Third Edition: Receptive (BBCS-3:R)[1] served as the measure of children's school readiness and concept development. Assessors, trained by the Florida Institute of Education (FIE), administered the BBCS-3:R and recorded children's responses on scannable forms. Computer programs, developed at FIE, scored the scanned data.

The BBCS-3:R is a battery of 10 scales designed to measure understanding of concepts that traditionally have been thought relevant to the development of young children. The first five scales form the School Readiness Composite (SRC) and include 85 items that assess concepts that are frequently and intentionally taught to children before and during formal schooling. The foundational concepts include the recognition of colors, recognition of letters of the alphabet, recognition of numbers and counting, size and comparisons, and the recognition of shapes. Separate scaled scores are not provided for these five foundational concepts. The remaining five scales (Direction/Position, Self-/Social Awareness, Texture/Material, Quantity, and Time/Sequence) measure basic concepts that are taught less frequently by families and, thus, taught more often in school settings. These concepts are now incorporated in Florida early childhood standards.

The Direction/Position scale measures relational terms that describe position and placement of objects including positional words (inside, outside, and above), directional words (near, far, right, and left), and properties of motions (backward and side-to-side). The Self-/Social Awareness scale measures knowledge of concepts that describe emotional states and kinship including personal characteristics (gender and age) and roles of the family. The Texture/Material scale measures knowledge of concepts that describe attributes of objects including difference in textures (smooth and rough) and sorting objects by texture. The Quantity

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[1] Bracken, B. A. (2006). *Bracken Basic Concept Scale-Third Edition: Receptive.* San Antonio, TX: Harcourt Assessment, Inc.

scale measures knowledge of concepts that describe quantity and how it can be manipulated including part/whole relationships (whole, half, and piece), language that compares quantity (more, several, less, greater than) and comparison of objects by capacity/volume (empty, full, and enough). The Time/Sequence scale measures concepts that describe occurrences on a continuum (such as calendar events) and the degree of speed and the time of day (morning and night), vocabulary related to time (before and after), relative position sequence (ordinal numbers), and sequence of events (beginning, middle, and end).

Children undergo rapid development over the age span covered by the assessments; therefore, raw scores are converted to standard scores relative to a normative group of children covering the age range of the test. This process adjusts scores for natural maturation and allows detection of gains resulting from programs. A change or lack of change in standard scores is always relative to the normative populations and does not represent an absolute gain in knowledge.

Preschool and Prekindergarten Children Defined

In the 2015-16 school year, FIE randomly sampled preschool and prekindergarten *School Readiness* children. Hereafter, 4-year-old prekindergarten and 3-year-old preschool children will simply be called *prekindergarten* and *preschool children*, and the terms *prekindergarten* and *prekindergarteners* will refer only to prekindergarten children and prekindergarten classes of children eligible to attend public school kindergarten in the 2016-17 academic year. The terms *preschool* and *preschoolers* will refer to only preschool children and preschool classes of children eligible to attend public school kindergarten in the 2017-18 academic year.

Evaluation Questions

School Readiness **Question 1: School Readiness Achievement**
To what extent did ELC *School Readiness* children demonstrate positive outcomes in school readiness as measured by the Bracken Basic Concept Scale, Third Edition: Receptive (BBCS-3:R) School Readiness Composite (SRC)?

School Readiness **Question 2: Basic Concept Achievement**
To what extent did the ELC *School Readiness* children demonstrate positive outcomes in school readiness achievement of basic concepts measured by the Bracken Basic Concept Scale, Third Edition: Receptive (BBCS-3:R)?

Analyses Plan

Data used to support the responses to Question 1 and Question 2 are the BBCS-3:R scores from a random sample of children selected from a sampling frame that listed all preschool and prekindergarten children who received subsidized childcare in fall 2015. The sampling frame was stratified by children's designation as preschoolers and prekindergarteners but was not further stratified by childcare center or class. Data were analyzed using repeated measures ANOVA models.

Effect sizes are reported to determine the importance of all statistically significant differences. Cohen classified effect sizes of 20% to 49% of a standard deviation as small, between 50% and 79% of a standard deviation as medium, and 80% or more of a standard deviation as large.[2] Small, medium, and large effect sizes represent meaningful differences. However, Cohen himself and other statisticians caution against interpreting effect sizes in such absolute terms. Moreover, researchers have demonstrated that small effect sizes can have important practical significance.[3] Kane found that a full year of elementary school resulted in an increase in children's achievement scores of 25% of a standard deviation; therefore, a 12.5% of a standard deviation increase represents the achievement of one half an elementary school year.[4] Bloom, Richburg-Hayes, and Black suggested that program effect sizes as small as 10% of a standard deviation can be important to educational policy.[5]

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[2] Cohen, J. (1988). *Statistical power analysis for behavioral sciences* (2nd ed.). Hillside, NJ: Lawrence Erlbaum Associates.

[3] Borman, G. D., Slavin, R. E., Cheung, A. C. K., Chamberlain, A. M., Madden, N. A., & Chambers, B. (2005). The national randomized field trial of Success for All: Second-year outcomes. *American Educational Research Journal, 42*, 673-696; Lipsey, M. W. (2003). Those confounded moderators in meta-analysis: Good, bad, and ugly. *Annals of the American Academy of Political and Social Science, 587*, 69-81. doi:10.1177/0002716202250791

[4] Kane, T. (2004). *The impact of after-school programs? Interpreting the results of four recent evaluations.* New York. NY: William T. Grant Foundation. Retrieved from http://www.afterschool.org/pdf/Grant%20afterschool.pdf

[5] Bloom, H. S., Richburg-Hayes, L., & Black, A. R. (2007). Using covariates to improve precision for studies that randomize schools to evaluate educational interventions. *Educational Evaluation and Policy Analysis, 29*(1), 30-59. doi:10.3102/0162373707299550

EVALUATION RESULTS: *SCHOOL READINESS* CHILDREN STUDY

The extent that ELC *School Readiness* children (children from low-income families receiving subsidized childcare) demonstrated school readiness gains was determined by whether sampled children made statistically significant fall to spring gains on the BBCS-3:R School Readiness Composite (SRC) and the basic concept achievement measured by the remaining five BBCS-3:R scales.

FIE trained assessors collected fall assessments in one-on-one settings from early October through early November 2015. Assessors returned from the third week in April through early June 2016 to collect spring assessments. In the fall, assessors visited a total of 226 childcare settings, 106 to collect preschool data and 183 childcare settings to collect prekindergarten data. In the spring, assessors returned to 188 childcare centers who continued to enroll the *School Readiness* sample children—79 to collect preschool data and 151 to collect prekindergarten data.

In the fall, FIE assessors collected data from 151 preschoolers and 350 prekindergarteners. In the spring, FIE assessors located and assessed 101 of the 151 preschoolers and 279 of the 350 preschoolers.

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***School Readiness* Question 1: School Readiness Achievement**

To what extent did ELC *School Readiness* children demonstrate positive outcomes in school readiness as measured by the Bracken Basic Concept Scale, Third Edition: Receptive (BBCS-3:R) School Readiness Composite (SRC)?

Attrition of School Readiness Children: BBCS-3:R School Readiness Composite

The study of attrition of the sampled children was based on the children's BBCS-3:R SRC scores. A determination of the importance of attrition involved investigating whether the attrition occurred at random or was systematic. Systematic attrition can result in a final sample of children that is different from the original sample relative to the children's initial school readiness or demographic characteristics. The BBCS-3:R SRC fall scores of the sampled children who were not administered the BBCS-3:R SRC in the spring (incomplete) were compared to fall scores of children who were administered the BBCS-3:R SRC in the spring (complete). Table 1 presents the BBCS-3:R SRC fall mean scores of the preschool and prekindergarten children with complete and incomplete data and the results of the analyses of any differences in their scores.

Table 1

BBCS-3:R SRC Fall Mean Scores for Preschool and Prekindergarten Children with Complete and Incomplete Scores

	Complete		Incomplete		
	n	*M*	*n*	*M*	*p*-value
SRC Preschool	101	9.24	50	8.42	.137
SRC Prekindergarten	279	9.63	71	8.21	<.001***

Note. *** indicates that *p* < .01; ** indicates that *p* < .05; and * indicates that *p* < .10.

The number of incomplete BBCS-3:R scores represents attrition of 33% of the preschoolers and 20% of the prekindergarteners. The analyses of the BBCS-3:R SRC scores indicated that the fall mean SRC scores of the prekindergarten (but not the preschool) children who did not complete the school year in their original centers or whose families did not receive state School Readiness subsidies at the time of the spring assessments were statistically different from the SRC fall mean scores of children with fall and spring data: The prekindergarten children with fall and spring scores had higher initial school readiness achievement.

Attrition also had an impact on the demographics of the final sample. Table 2 shows the percentage of children by ethnicity and gender in the original and final samples. As can be seen,

48.0% and 34.0% of the attrition of the preschool children resulted from losing Black boys and Black girls, respectively. These loses reduced the percentage of Black boys in the original sample from 41.1% to 37.6% in the final sample. In contrast, these loses increased the percentage of Black girls in the original sample from 41.1% to 44.6% in the final sample. Furthermore, 46.5% and 36.6% of the attrition of the prekindergarten children resulted from losing Black boys and Black girls, respectively. These loses reduced the percentage of Black boys in the original sample from 38.0% to 35.8% in the final sample. The change in the percentage of prekindergarten Black girls from the original to final samples was very small. Of note is that almost half of the attrition in the preschool and prekindergarten samples resulted from the loss of Black boys. In the case of prekindergarten attrition, again, the lost children were, on average, low-performing.

Table 2

The Impact of the Attrition of Black Children

Children	Samples					
	Preschool Percentages			**Prekindergarten Percentages**		
	Original	**Attrited**	**Final**	**Original**	**Attrited**	**Final**
Black Boys	41.1	48.0	37.6	38.0	46.5	35.8
Black Girls	41.1	34.0	44.6	38.3	36.6	44.6

Thus, there is evidence that attrition was systematic relative to the prekindergarten children's initial school readiness achievement and to the demographic distribution of both groups of children. Therefore, results of these analyses should be cautiously interpreted.

Demographic Characteristics of the School Readiness Sample

The sampling resulted in complete BBCS-3:R SRC scores for 101 preschoolers and 279 prekindergarteners. Table 3 presents characteristics of the sample of *School Readiness* children. Ethnicity data were collected across six categories; however, four categories (*Asian*, *Mixed*, *Hispanic*, and *Other*) were collapsed into one category, *Other*, because of their small representation in the sample. The preschool and prekindergarten sampled children included fewer boys than girls, and more than 75% of the children were Black.

Table 3

Demographic Characteristics of the Sampled Preschool and Prekindergarten Children

Characteristic	Level	Preschool		Prekindergarten	
		n	*%*	*n*	*%*
Sex	Boys	50	49.5	138	49.5
	Girls	51	50.5	141	50.5
Ethnicity	Black	83	82.2	208	74.6
	White	13	12.9	49	17.6
	Other	5	5.0	22	7.9

Results: School Readiness Question 1

Preschool and prekindergarten children were assessed using the SRC portion of the BBCS-3:R. Data were analyzed using separate repeated measures ANOVA models for the preschool and prekindergarten children. Table 4 presents BBCS-3:R SRC summary statistics by the children's status as preschoolers or prekindergarteners and the results of the analyses.

Table 4

BBCS-3:R SRC Summary Statistics and Analyses Results

Children		Fall		Spring		
	n	*M*	*SD*	*M*	*SD*	*p*-value
SRC Preschool	101	9.24	3.03	9.51	2.96	.194
SRC Prekindergarten	279	9.63	2.92	9.62	2.52	.948

Note. *** indicates that $p < .01$; ** indicates that $p < .05$; * indicates that $p < .10$.

The preschool and the prekindergarten children's BBCS-3:R SRC scores did not indicate that they made fall to spring gains in school readiness achievement. However, from fall 2015 to spring 2016, the percentile rankings of the preschool children's mean SRC scores changed from ranking at the 40th to the 44th percentile, and the prekindergarten children's mean score percentile rankings remained the same at the 45th percentile.

Another way to look at the ELC *School Readiness* children's level of school readiness achievement is to look at the fall to spring differences in the percentages of scores ranked in the BBCS-3:R achievement categories. (Scores below 4 are classified *Very Delayed*, from 4 to 6 are classified *Delayed*, from 7 to 13 are classified *Average*, from 14 to 16 are classified *Advanced*, and above 16 are classified *Very Advanced*.) Figure 1 shows the percentages of preschool and prekindergarten scores in the BBCS-3:R achievement categories in the fall and spring.
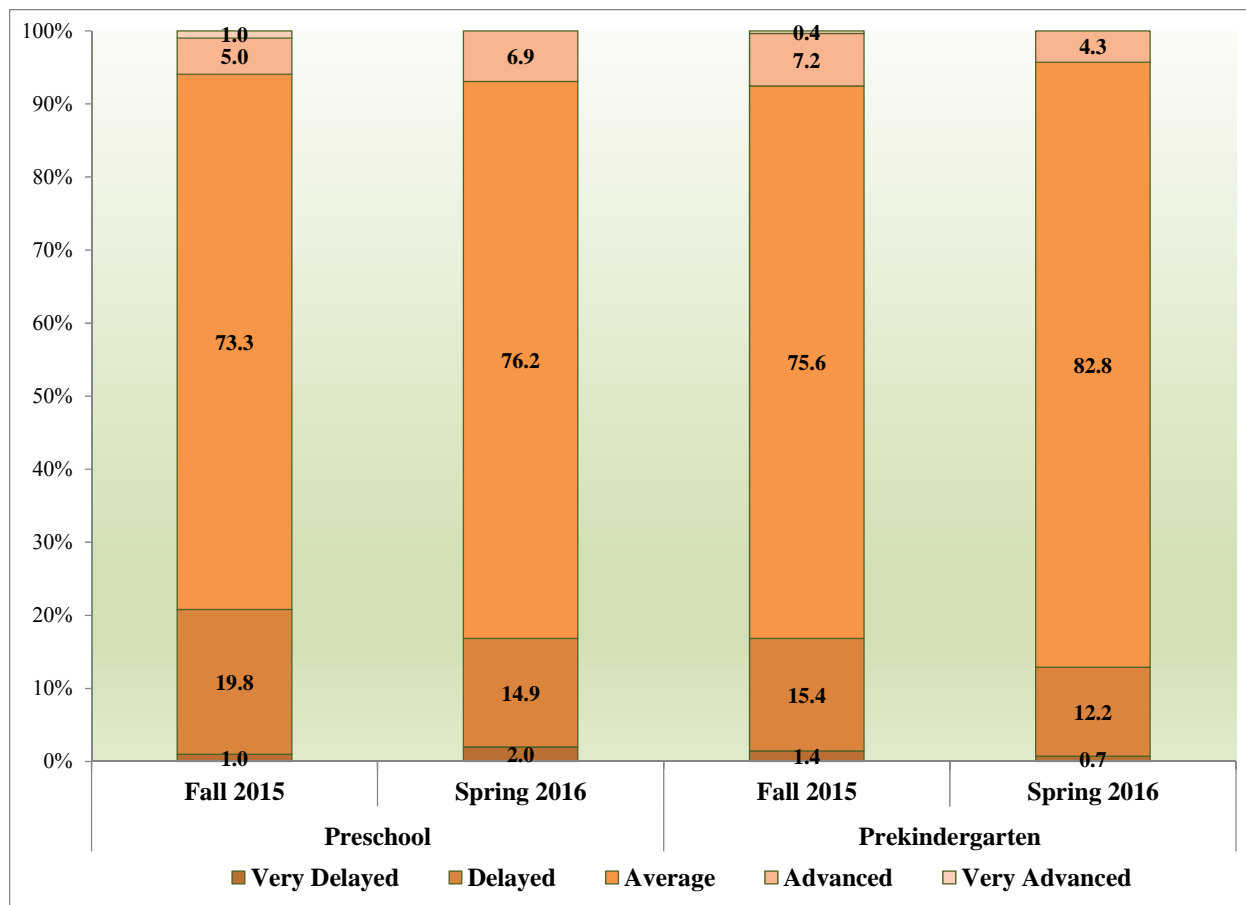
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Figure 1. The percentage of *School Readiness* children's BBCS-3:R SRC scores categorized as *Very Delayed* to *Very Advanced* in the fall and spring of the school year (*n* = 101 preschool and *n* = 279 prekindergarten children).

As can be seen in Figure 1, the preschool children's BBCS-3:R SRC individual scores improved from fall to spring which resulted in more spring than fall scores categorized *Average* or higher. The fall scores of 79% of the preschoolers were classified *Average* or higher, and 83% of the preschoolers' spring scores were classified *Average* or higher. Additionally, the fall scores of 83% of the prekindergarten children were classified *Average* or higher, and 87% of the prekindergarten children's spring scores were classified *Average* or higher.

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School Readiness Question 2: Basic Concept Achievement

> To what extent did the ELC *School Readiness* children demonstrate positive outcomes in school readiness achievement of basic concepts measured by the Bracken Basic Concept Scale, Third Edition: Receptive (BBCS-3:R)?

Attrition of School Readiness Children: BBCS-3:R Basic Concepts

The study of attrition of the sampled children was based on the children's fall BBCS-3:R basic concept achievement scores. A determination of the importance of attrition involved investigating whether the attrition occurred at random or was systematic. The BBCS-3:R fall scores of sampled children who were not administered the BBCS-3:R basic concept scales in the spring (incomplete) were compared to fall scores of children administered the BBCS-3:R in the fall and spring (complete). Table 5 presents the BBCS-3:R fall mean scores of the children with complete and incomplete data and the results of the analyses of differences in their scores.

Table 5

BBCS-3:R Mean Scores for School Readiness Preschool and Prekindergarten Children with Complete and Incomplete Scores

Scale	Preschool			Prekindergarten		
	Complete *Mean*	Incomplete *Mean*	*p*-value	Complete *Mean*	Incomplete *Mean*	*p*-value
Direction/Position	7.25	7.50	.667	8.59	7.58	.004**
Self-/Social Awareness	7.82	7.66	.740	8.60	7.80	.023**
Texture/Material	8.47	7.92	.248	8.84	8.18	.049**
Quantity	8.17	7.70	.289	8.26	7.20	.002**
Time/Sequence	8.61	8.16	.415	8.74	8.21	.090*

Note. *** indicates that $p < .01$; ** indicates that $p < .05$; * indicates that $p < .10$.

The initial mean scores of the preschool children with complete scores were not statistically different than those of the preschool children with only fall scores. Thus, attrition of preschoolers occurred at random relative to their initial status. In contrast, all of the initial mean scores of the prekindergarten children with fall and spring scores were statistically different from those of the prekindergarten children with only fall data. The prekindergarteners with fall and spring data exhibited higher initial status on all scales. Therefore, attrition of prekindergarteners did not occur at random relative to their initial status. Furthermore, 46.5% of the prekindergarten attrition occurred by the loss of Black boys—possibly, on average, lower-performing. The scores

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of the remaining 279 prekindergarteners should be interpreted with caution and not generalized to the whole population of *School Readiness* prekindergarten children.

Results: School Readiness Question 2

Table 6 presents preschoolers' fall and spring basic concept mean scores and the results of statistical analyses for BBCS-3:R scales. The preschoolers' highest spring mean score was the Time/Sequence score, and the lowest spring mean score was the Quantity mean score. The greatest difference in the fall and spring mean scores was for the Direction/Position scale. The scores of these five school readiness level basic concept scales were analyzed using repeated measures ANOVA models.

Table 6

BBCS-3:R Scales: Summary Statistics and Analytic Results for Preschool School Readiness Children (n = 101)

Scale	Time	M	SD	p-value	Effect Size	Percentile Ranking
Direction/Position	Fall	7.25	3.34	<.001***	0.52	18th
	Spring	8.82	2.89			35th
Self-/Social Awareness	Fall	7.82	2.68	.077*	0.14	23rd
	Spring	8.25	2.93			28th
Texture/Material	Fall	8.47	2.59	.310		31st
	Spring	8.23	2.45			28th
Quantity	Fall	8.17	2.42	.777		27th
	Spring	8.24	2.51			28th
Time/Sequence	Fall	8.61	3.19	.286		32nd
	Spring	8.97	2.55			37th

Note. Effect sizes are relative to the BBCS-3:R normative population.
*** indicates that $p < .01$; ** indicates that $p < .05$; * indicates that $p < .10$.

The preschool children made statistically significant fall to spring improvement on the BBCS-3:R scales measuring Direction/Position and Self-/Social Awareness (effect sizes of 52% and 14% of a standard deviation, respectively).

Table 7 presents prekindergarteners' fall and spring basic concept mean scores and the results of statistical analyses for BBCS-3:R scales. The highest spring mean score was the Time/Sequence scale, and the lowest spring mean score was the Quantity scale. The greatest difference in the fall and spring mean scores was also the Quantity scale. The scores of these five school readiness level basic concept scales were analyzed using repeated measures ANOVA models.

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Table 7

BBCS-3:R Scales: Summary Statistics and Analytic Results for Prekindergarten School Readiness Children (n = 279)

Scale	Time	*M*	*SD*	*p*-value	Effect Size	Percentile Ranking
Direction/Position	**Fall**	8.59	2.66	.074*	.09	32nd
	Spring	8.85	2.93			35th
Self-/Social Awareness	**Fall**	8.60	2.65	.016**	.11	32nd
	Spring	8.92	2.32			36th
Texture/Material	**Fall**	8.84	2.51	.171		35th
	Spring	9.01	2.52			37th
Quantity	**Fall**	8.26	2.57	<.001***	.14	28th
	Spring	8.68	2.56			33rd
Time/Sequence	**Fall**	8.74	2.44	.009**	.12	34th
	Spring	9.09	2.33			38th

Note. Effect sizes are relative to the BBCS-3:R normative population.
*** indicates that $p < .01$; ** indicates that $p < .05$; * indicates that $p < .10$.

The prekindergarten children made statistically significant fall to spring improvement on the BBCS-3:R on the Direction/Position, Self-/Social Awareness, Quantity, and Time/Sequence scales (effect sizes of 9%, 11%, 14%, and 12% of a standard deviation, respectively).

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School Readiness Children: Summary

Figures 2 and 3 present school readiness and basic concept achievement summaries using the percentile rankings of the fall and spring mean scores of the preschool and prekindergarten *School Readiness* children, respectively.
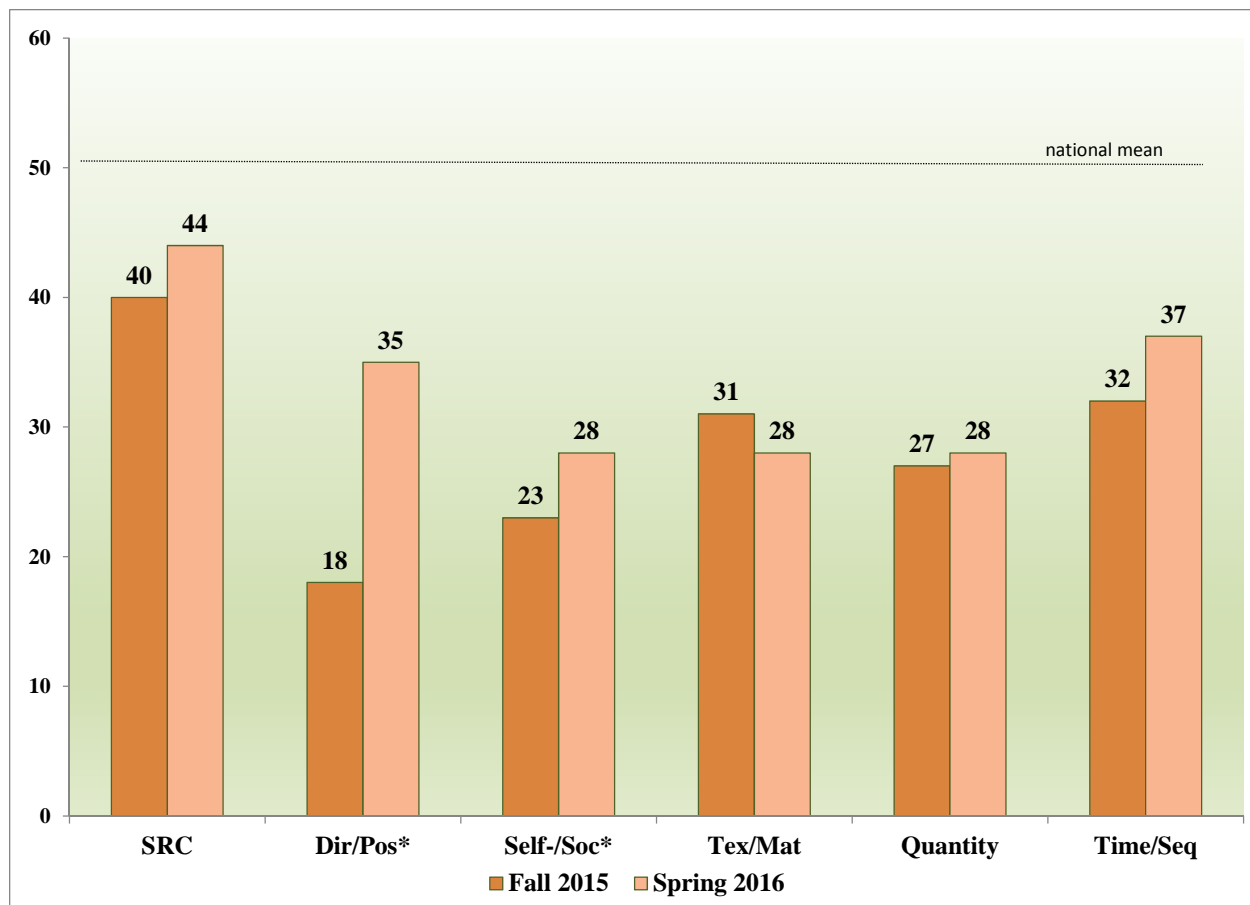

Figure 2. Summary of fall to spring percentile rankings of the BBCS-3:R mean scores of the preschool children (n = 101). An asterisk indicates statistically significant growth from fall to spring. SRC is the School Readiness Composite, Dir/Pos is Direction/Position, Self-/Soc is Self-/Social Awareness, Tex/Mat is Texture/Material, and Time/Seq is Time/Sequence.

In the spring, the preschool BBCS-3:R mean scale scores were ranked minimally at the 18th percentile. The largest fall to spring change in the mean score percentile rankings (17 percentiles) occurred for the preschool children's Direction/Position scale scores. The School Readiness Composite mean spring score was the only score ranked at least at the 40th percentile.
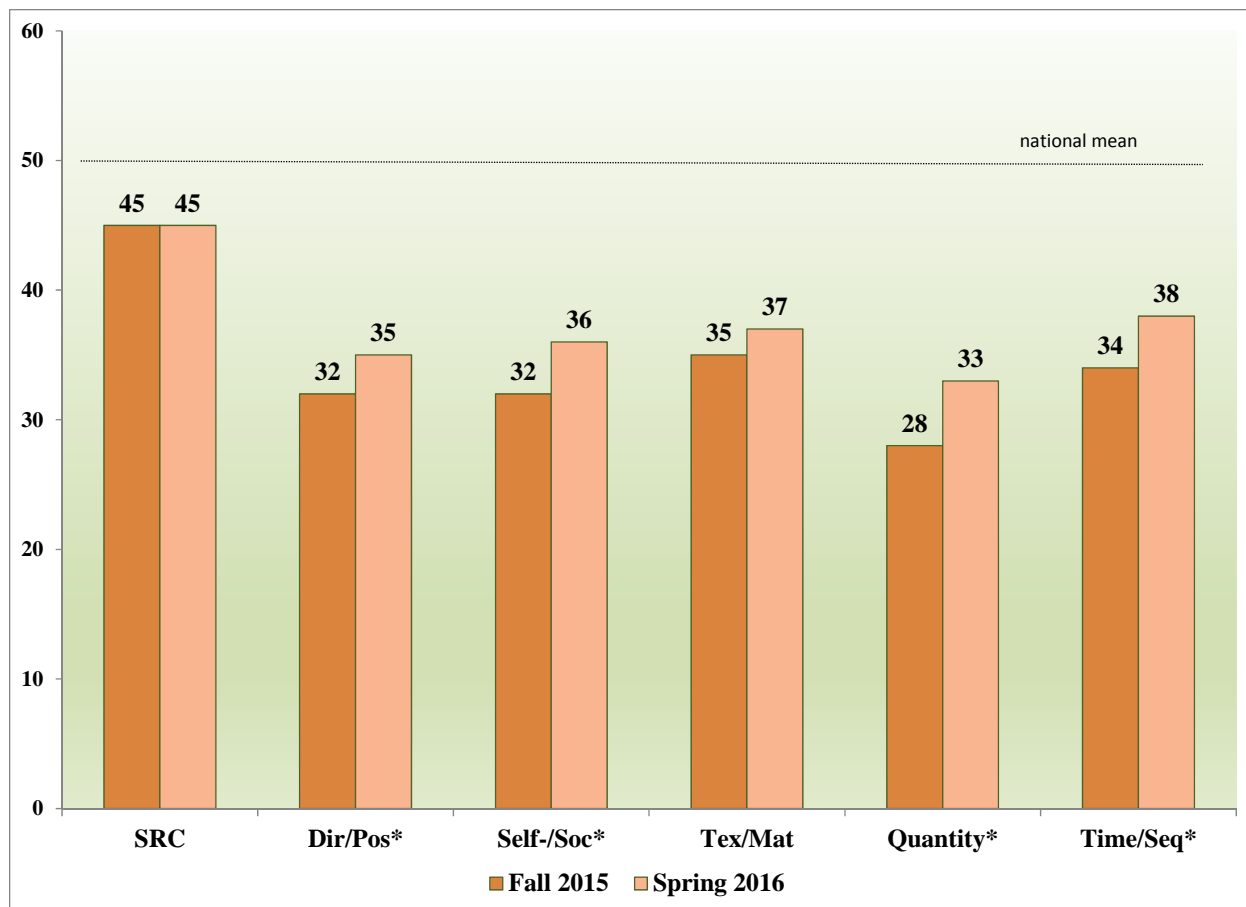
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Figure 3. Summary of fall to spring percentile rankings of the BBCS-3:R mean scores of the prekindergarten children (*n* = 279). An asterisk indicates statistically significant growth from fall to spring. SRC is the School Readiness Composite, Dir/Pos is Direction/Position, Self-/Soc is Self-/Social Awareness, Tex/Mat is Texture/Material, and Time/Seq is Time/Sequence.

In the spring, the prekindergarten BBCS-3:R mean scale scores were ranked minimally at the 28th percentile. The largest fall to spring change in the mean score percentile rankings (5 percentiles) occurred for the prekindergarten children's Quantity score. The only spring mean score ranked minimally at the 40th percentile was the School Readiness Composite mean score.

Bulleted Summary: School Readiness Achievement

- The *School Readiness* final sample included preschool ($n = 101$) and prekindergarten ($n = 279$) children who, in the spring, were assessed in 79 and 151 childcare centers, respectively.

- The *School Readiness* sampled preschool and prekindergarten children included slightly more girls than boys. Black children made up the largest ethnicity in the sample (82% of the preschoolers and 74% of the prekindergarteners).

BBCS-3:R School Readiness Composite Achievement

- Attrition resulted in the loss of 31% of the preschool and 20% of the prekindergarten children. Attrition did not occur at random. Prekindergarten children lost to the evaluation had lower initial status than the children who finished the school year in their original childcare centers. The loss of children also altered the ethnicity distribution of the sample.

- *School Readiness* preschool children did not demonstrate a statistically significant gain on the BBCS-3:R School Readiness Composite scale. However, the mean score increased from the 40th percentile in the fall to the 44th percentile in the spring.

- The *School Readiness* prekindergarten children did not demonstrate a statistically significant gain on the BBCS-3:R School Readiness Composite scale and the percentile ranking of the mean score remained the same in the fall and the spring, the 45th percentile.

- In the spring, 83% of the *School Readiness* preschool children and 87% of the prekindergarten children had BBCS-3:R School Readiness Composite scores classified *Average* (at the 25th percentile) or higher.

Basic Concept Achievement

- The *School Readiness* preschool children demonstrated statistically significant gains on the BBCS-3:R Direction/Position and Self-/Social Awareness scales with effect sizes of 52% and 14% of a standard deviation, respectively.

- The *School Readiness* prekindergarten children demonstrated statistically significant gains on the BBCS-3:R Direction/Position, Self-/Social Awareness, Quantity, and Time/Sequence scales with effect sizes of 9%, 11%, 14%, and 12% of a standard deviation, respectively. (Attrition for these scales did not occur at random relative to initial status. The sample used in the analyses had, on average, higher initial status than the children lost to the study.)

Overall BBCS-3:R Summary

- All *School Readiness* children's spring mean BBCS-3:R scores ranked higher than the bottom quartile (above the 25th percentile).

- The *School Readiness* preschool children's spring School Readiness Composite mean score was the only preschool spring score ranked minimally at the 40th percentile or higher (the 44th percentile).

- The *School Readiness* prekindergarten children's spring School Readiness Composite mean score was the only prekindergarten spring score ranked minimally at the 40th percentile or higher (the 45th percentile).

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